

Remarks

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Initially, the cross reference to the parent application, inserted by the Preliminary Amendment filed with the present application, has been amended to indicate the abandoned status of the parent application.

Applicants acknowledge the withdrawal of claims 14-31 and 52-81 from further consideration, as being directed to a non-elected invention.

The independent claims under consideration are claims 1, 32 and 42. Each of these claims has been amended in a similar manner, to reflect that the claimed material is a "membrane casted material", which is supported by, for example, page 11, lines 15-18, referring to "membrane forming cast liquid". Conforming amendments have therefore been made in the rest of these independent claims.

Language has been inserted at the end of each of these independent claims to refer to binding the segregating membrane and segregating membrane supporting material. This reflects the disclosure in, for example, paragraphs [0014] and [0048] of the specification.

Other changes have been made in the independent claims to place them in more conventional form according to U.S. practice.

The preamble of each of the dependent claims under consideration has been amended to correspond to the preamble of the independent claims.

The patentability of the presently claimed invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 32-37 and 39-41 under 35 U.S.C. §103(a) as being unpatentable over Morweiser et al. in view of Jones is respectfully traversed.

The present invention serves "to provide a laminated material of a segregating membrane and a segregating membrane supporting material wherein segregating membrane adhesion strength is increased, and in addition a uniform segregating membrane can be formed [0007]." To achieve this object, the claimed invention employs

the same solvent dissoluble with respect to both the segregating membrane and segregating membrane supporting material, i.e., the solvent for the fibers which make up the segregating membrane supporting material [non-woven fabric] is the same as the solvent for forming the segregating membrane. Such common solvent facilitates the production process for the membrane casted material and results in dramatically improved adhesion strength between the segregating membrane and its supporting material [0014].

Such selection of common solvent is not disclosed or suggested in any of the cited references, and because of such distinction, advantageous result of improved adhesion strength can be achieved, and the present invention is not obvious to the skilled person in the art.

The Examiner acknowledges that the Morweiser et al. reference fails to teach combining the filter material with a segregating membrane, but takes the position that it would have been obvious to one having ordinary skill in the art to combine the high loft nonwoven layer taught by Jones with the filter material disclosed by Morweiser et al. since both Morweiser et al. and Jones disclose that the individual filter layers can be combined with other filter layers to make a composite filter.

The newly cited Jones reference relates to laminated filters, “More particularly, this invention relates to laminated filters *used to filter inlet air for internal combustion engines*, in which particular nonwoven fabrics are employed in combination with other filter media or elements.” (Column 1, lines 5-10.) That is, the laminated filters of this reference are used as **air filters**, not as a segregated membrane such as ultra-filter membranes, precision filter membranes, and reverse osmosis membranes as in the present invention [0001]. In other words, air filters cannot be used as reverse osmosis membranes. Also, the object of the present invention is to satisfy “membrane adhesion strength capable of withstanding reverse-pressure cleaning” and “more robust membrane adhesion strength” [0006]. Such problem would not be solved by the laminated filters disclosed in Jones.

Further, because Jones does not relate to a segregated membrane, the skilled person in the art would not combine Jones with Morweiser et al. Even if these references were combined, the result of such combination would still not lead to the presently

claimed invention, because the processes for preparing the segregated membrane and laminated filter are completely different from each other.

Specifically, the laminated filter disclosed in Jones is made of multiple layers of filters, while the segregated membrane of the present invention is made just of a membrane, which is casted on its support material.

In particular, Jones requires a powder to bond nonwoven layers. Such bonding material or process is not necessary for the present invention, instead, a common solvent is used to dissolve both membrane and its support in the solution at the same time, resulting in effective deposition/formation and adhesion being achieved.

The rejection of claims 1-10, 12 and 13 under 35 U.S.C. §103(a) as being unpatentable over Morweiser et al., in view of Jones and Schultink et al., as well as the rejection of claim 38 under 35 U.S.C. §103(a) as being unpatentable over Morweiser et al. and Jones and further in view of Schultink et al., the rejection of claims 42-47 and 49-51 under 35 U.S.C. §103(a) as being unpatentable over Morweiser et al. in view of Jones and Dean et al., the rejection of claim 11 under 35 U.S.C. §103(a) as being unpatentable over Morweiser et al., Jones, Schultink et al. and further in view of Dean et al., and the rejection of claim 48 under 35 U.S.C. §103(a) as being unpatentable over Morweiser et al., Jones, Dean et al. and further in view of Schultink et al., are respectfully traversed.

The comments set forth above concerning the Morweiser et al. and Jones references are equally applicable to each of these rejections.

Neither the Schultink et al. nor the Dean et al. reference discloses or suggests the subject matter of the claims after entry of the foregoing amendments, particularly with regard to the feature of the invention that the polyacrylonitrile-based synthetic fibers included in the nonwoven fabric are dissoluble in amide-based solvents or in sulfoxide-based solvents as a mutual solvent for forming the segregating membrane. Nor do the references suggest the advantage of this feature of the invention that it improves adhesion strength between the segregating membrane and the supporting material.


In addition, the Schultink et al. reference relates to filters for removing particles from gases, and Dean et al. relates to binder fibers. In view of these completely different technologies, Applicants respectfully submit that those skilled in the art would not combine the references in the manner suggested by the Examiner.


For these reasons, Applicants take the position that the presently claimed invention is patentable over the applied references.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

Yoshitsugu HAMA et al.

For: 
Michael R. Davis
Registration No. 25,134
Attorney for Applicants

By: 
Amy E. Pulliam
Registration No. 55,965
Attorney for Applicants

MRD/pth
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
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